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EFFECTS OF DOCTRINE AND EXPERIENCE ON CLOSE AIR
SUPPORT OPERATIONS IN KOREA (1950-1951)

by

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Preface

I have often thought that the Korean War was a unique experience in our military's history. Shadowed between the experiences of WWII and Vietnam, it offers relevant lessons that are applicable today.

With today's evolvement of technology or Revolutions in Military Affairs (RMA) it would be easy to leap into the future and base our airpower doctrine solely on theoretical conception of what war should look like. This approach had a detrimental impact on the British strategic bombing campaign during WWII and the belief that "the bomber would always get through. This conceptual approach also dominated the USAF's air power doctrine into the Korean War as well. Strategic air power was thought to be the best way to defeat our enemy, especially now that the atomic bomb existed. However, the Korean environment offered minimal strategic targets

The strategic lessons learned from WWII were less relevant in Korea compared to those lessons learned by Navy and Marine air during amphibious assaults in the Pacific during WWII and those learned by the Marines in South America in the 1920's. In this paper I have looked at how those lessons impacted Korean Close Air Support operations.

In today's changing political environment it is difficult to assess what nature our nation's next war will be. We need to look at all of our past conflicts as well as our most recent. To disregard portions of the past because they do not fit with our current

technology or political landscape is a general disregard for an evidentiary based approach to the preparation of our military.

Abstract

Close Air Support provided by Naval and Marine airpower in Korea differed than that provided by the United States Air Force. This difference can be traced back to each services experience prior to Korea.

In this paper it was found that the conflicts experienced by Navy and Marine aviators during the 1920's and WWII better prepared them for Close Air Support operations in the Korean environment. Countering Nicaraguan rebels and Japanese troops in the Philippines created doctrine that the Navy and Marines would translate into procuring weapon systems, communication technology and training. This better prepared them to support friendly ground forces compared to the Air Force.

In Nicaragua, the Philippines and Iwo Jima the enemy's center of gravity was its army. These experiences were instrumental in preparing maritime airpower to counter the North Korean Army.

Part 1

Introduction

Opening Stage

During the predawn hours on 25 June 1950, the soldiers of the North Korean People's Army (NKPA) moved southward across the 38th parallel invading the Republic of Korea. The NKPA was a force of 135,000 trained soldiers, outfitted with Soviet tanks, artillery and aircraft. Portions of the army were trained Chinese and Japanese conscripts. This formidable threat significantly outmatched a poorly trained and equipped 100,000 member Republic of Korea constabulary force. (Kropf, 34)

Within a month, the North Korean Peoples Army (NKPA) drove the United Nations forces to a perimeter around Pusan. Because of the ill preparedness of U.N ground forces, air power had to play a vital role in holding back the waves of North Korean soldiers that could have lead to the defeat of UN forces. Lieutenant General Walton Walker, Commander of the 8th Army in Korea, stated that, "If it had not been for the air support we received, we would not have been able to stay in Korea." (Kropf, 36) While close air support was a major factor in holding back the North Korean Army (NKA) there were many problems associated with the use of airpower in the close air support mission.

In this paper I will examine how experience and doctrine can relate to success on the battlefield. I intend to show how the experiences of Navy and Marine Air Forces in the

inter-war years and the Pacific Theater during WWII related directly to their efficiency in supporting ground forces in Korea. Although USAF airpower played a significant role in Korea, I intend to show how experience creates doctrine that is effective during times of war.

There were many critical phases in the Korean War but the event I will discuss is the holding of the Pusan perimeter. Due to the circumstances surrounding U.S. ground forces during this particular event, having little artillery and an insufficient supply of anti-tank weapons, it was critical that they have effective close air support (CAS). Air Support missions flown by the Far East Air Force (FEAF), the Navy's 77th Task Force and the Marines 1st Air Wing played a critical role in this campaign. However, these missions did not come without flaws. The areas of preparedness going into the Korean War that I will discuss in order to highlight the effectiveness of Close Air Support (CAS) are:

- a) Doctrine / Training
- b) Organization
- c) Weapons (aircraft and ordnance)
- d) Communications and Control

Doctrine and training will be the areas emphasized since from this, the areas of command organization, weapons systems, and communications equipment and procedures are developed.

It is important to note that prior to and during the Korean War the definition of Close Air Support varied. The definition written in the Dictionary of United States Military Terms for Joint Usage read, "Close Air Support is air action against hostile surface

targets which are so close to friendly forces as to require detailed integration of each air mission with the fire and movement of those forces.” (Hallion, 214) A definition written in an operational report on CAS for the Korean War stated that CAS was “Those air missions, controlled by either ground or air, attacking targets inside the bomblines.” (Whitson, 9) While another report says that CAS is, “Air assets supporting ground forces in contact and controlled by forward ground controllers or airborne controllers”. (Kompf, 17) The omission of the word “bomblines” and the implications of being controlled by an airborne or ground controller will be discussed later. However it is essential to note that the lack of detailed procedures prior to the war contributed to the difference in support the Army received from the Air Force as compared to the Marines by Marine and Navy air.

Along with this, each service’s prior experience contributed to its own doctrine. This created differences in CAS provided by the FEAF and the Navy and Marine Air Forces. Because each service’s mission is different from the other, comparing CAS systems would be like comparing apples to oranges. The intent of this paper is to show how experience relates to doctrine that when applied can create success and efficiency on the battlefield.

Holding the Perimeter

In July of 1950, the U.S. 24th infantry located just south of Seoul began its defense. Located just behind them was the 34th Division. Both divisions lacked tanks and heavy artillery because of the hasty transport from Japan. (Hastings, 77) On July 6th, the U. S. force, equipped as no more than a light infantry, became engaged by a vastly superior equipped North Korean communist force that used envelopment tactics to trap them. U.S. forces were vulnerable to this tactic due to their willingness to use roads and

valleys in the beginning of the war, thereby giving up the high ground to the North Koreans. The U.S. 24th and 34th Divisions quickly found the enemy closing in.

The 34th Battalion Commander, Lieutenant Colonel Harold Hayes saw no alternative other than retreat. A few minutes ahead of the NKA T-34 tanks, the Americans hastened southward among a trail of South Korean refugees, abandoning what equipment they were supplied with.

This battle at Chonan in July 1950 during the early stages of the war followed by a series of stances and retreats after it, characterized the UN force's first engagements with the North Koreans in the summer of 1950.

On July 31st, 1950, just east of the Naktong River, the Americans reluctantly started to dig in at the orders of General Walton Walker, Commander of the 8th Army in Korea. Along this 130-mile front that encircled the city of Pusan, U.N. forces began what was to be known as the defense of the Pusan Perimeter.

Part 2

Close Air Support at Pusan

In the opening stages of battle, U.S air power wasn't offset by the North Korean Air Force but by the North Korean Army. (Hallion, 40) As the Pusan perimeter tightened, USAF aircraft withdrew its tactical airpower from Korea and into Japan as the North Korean Army moved south, taking over critical airfields.

Prior to the re-staging of USAF tactical airpower in Japan, CAS provided by the FEAF had its weaknesses due to coordination, equipment failure and communications. These will be discussed later. However the movement of tactical aircraft from Korea to Japan further compounded the USAF's ability to provide effective CAS. The distance from Japan to Korea would impact the USAF's response time and time on station for the already fuel critical F-80, F-84's. During these early stages, some USAF squadrons would trade their jet aircraft for F-51 propeller aircraft in order to increase their endurance and payload capacity. As Lieutenant General Partridge, Commander of the 5th Air Force recalled on the F-80's lack of payload and fuel problems, "Kelly Johnson (the F-80's designer) came over and watched them take off from Taegu with two wing tanks full and carrying one 500 pound bomb in addition. He turned away and said, "I can't watch." (Hallion, 40)

However, B-29 and B-26 aircraft would still be able to attack large quantities of NKA troop columns and convoys. The impacts of the sorties were not known. At the time there was a lack of knowledge of where the North Korean forces were. The Intel on the specific location of targets was scarce and there were no effective systems for Forward Air Control (FAC) at the time. In those first weeks of war, the USAF poured thousands of tons of bombs onto Korea. "There is little evidence that these proved more than an irritant to communist operations in the first stage of war." (Whitson, 12) The North Korean Army was still able to move supplies and troops southward that effectively drove the 8th Army southward. (Hastings, 77)

As the Air Force made due with bases in Japan, the Navy and Marines were in a position to provide large quantities of CAS. Task Force 77 was an attractive option because carriers could be located off the shore and provide "on call" CAS, utilizing F-4U Corsairs and AD Skyraider aircraft capable of carrying generous amounts of ordnance with long on station times. (Hallion, 246) In August 1950, the situation around Pusan became so critical that the 8th Army directly requested CAS from Navy and Marine Air Forces attached to Task Force 77. (Hallion, 42)

Major General O. P. Weyland, Vice Commandant for Air Operations in Korea, wrote to Air Force Chief of Staff, Hoyt Vandenberg, that "Korea has provided an ideal area for employment of carrier based aircraft in tactical operations. The type aircraft used by the Navy and USMC – fighters and dive-bombers – are well suited to this type of work. In the absence of hostile air operations, they have performed well and have been of great assistance." (McMasters, 54)

The CAS that Navy and Marines provided would start a controversy that lasted for the entire war. The question of who had the best interpretation of CAS? The grimmer the Korean situation became, the more critical the debates. These debates were even more hostile than the traditional debates on the use of airpower in WWII. It was believed that "Unless one system was used, the Korean situation would be doomed." (Hallion, 41)

Part 3

Doctrine

“The resultant confusion and low level of efficiency provide impressive evidence that planning and operating aircraft in support of ground forces requires a relatively intricate system including well – designed and well – organized communications, and personnel trained and experienced in the various functions. There will be no dissent from the opinion that nearly all of the early difficulties could have been avoided merely by having a close support system in being.” (Whitson, 8)

“In the Air Force the aircraft already in the theater had not been designed for close air support operations, were organized for interceptor operations, and lacked several items of equipment needed to carry the necessary ordnance as well as some of the ordnance itself.” (Whitson, 7)

“...There were almost no personnel who had experience in the specialties of air ground planning and coordination.” (Whitson, 7)

The above statements are taken from a preliminary evaluation written in February of 1951, covering the effectiveness of Air Force CAS operations in support of the Army during June 1950 to January 1951.

FEAF and Eighth Army Doctrine / Training

The Far East Air Force (FEAF) and the 8th Army Close Air Support doctrine was a product of numerous WWII campaigns that started in North Africa and lasted throughout the European theater. In this theater, Allied airpower was given missions to guard ground force's flanks, attack German tank columns and troop concentrations.

Because of this experience, CAS was considered to be an adjunct to the Army's artillery and not a substitute for. It was assumed that targets inside 1000 yards of friendly forces would be the responsibility of the Army's heavy artillery and anything outside of that would be that of the Air Force. (Whitson, 12) This was because of the belief that the Army would have its own artillery to effect target inside the bomblines. Prior to the Korean War, the Army and USAF doctrine called for tactical air support outside of a 1000 yards from friendly troops. (Whitson, 12) However, the Korean theater did not allow the Army to have an abundance of heavy artillery. This was primarily due to the Korean landscape and the hasty employment of forces in theater during the early stages of the conflict. The 8th Army possessed the capabilities of a light infantry and was also abandoning the pieces of artillery they did have as they retreated towards Pusan. They desperately needed support inside the bomblines. In other words, close air support as a substitute for artillery.

From a doctrinal point of view, the FEAF and USAF doctrine in 1950 assumed that the next war would be an atomic one. Because of the assumption that strategic air power won the war with Japan, the USAF was primarily equipped for the defense of Japan from the Soviet and Chinese threats and the B-29 to carry out atomic missions. Tactical ground attack aircraft (F-51), reconnaissance and transport aircraft were scarce. "Aircraft

already in theater had not been designed for close air support operations. They were organized for interceptor operations, and lacked several items of equipment needed to carry the required ordnance as well as lacking the correct ordnance.” (Whitson, 7)

According to the 1951 CAS preliminary study, when looking at USAF tactical air support sorties flown inside the bomblines, the average sortie per army division per day was nineteen as compared to the 37 close air support sorties per day the Marine divisions were receiving. During the Pusan campaign, the 8th Army required more sorties to help fend off the waves of NKA advances. (Whitson, 12) The report also states that the average distance bombed was 3 to 4 miles beyond friendly troops. Due to the lack of heavy artillery, the 8th Army desperately needed support well within that mark to counter against the NVA T-34 tanks.

Navy and Marine CAS doctrine

The Navy and Marine’s interpretation of CAS was similar to “trench strafing” in WWI and was a product of the Marine’s experience in “brush fires” during the inter-war years and WWII. (Hallion, 48)

During the inter-war years, Marine air supported ground forces in Haiti, the Dominican Republic and Nicaragua. Air power provided artillery for lightly armed land forces that required heavy artillery support.

This was particularly evident for the Marines in 1927 in Nicaragua. This is when Marine aviators first became involved in a series of Nicaraguan revolutions. On July 25th a 37 man Marine garrison was under attack by a several Sandinista force consisting of several hundred in a small town called Ocotal. The Marines were at least ten travel days through rugged mountainous terrain from any reinforcements. On that day 5 Marine DH

aircraft were on patrol when they spotted the Marine ground forces under attack. The Marine aircraft then organized the first low altitude dive bombing attack in support of ground troops, killing 200 Sandinistan soldiers. After this Nicaraguan experience, the Marines were the first to adopt the doctrine of supporting ground forces through air power as a standard operating procedure. (Sherrod, 25)

In the pacific theater during WWII, the Navy and Marines evolved a joint CAS system that introduced air liaison parties to assist ground commanders with target selection and directed strikes from ground and airborne controllers.

Through real world experiences that involved bloodshed, the Navy and Marine Corp developed a CAS system that reflected a commitment of supporting lightly armored landing forces. CAS was considered as an artillery substitute. Prior to Korea, Navy and Marine airpower became proficient at providing close support within 50-300 yards of ground troops. (McMasters)

Part 4

Organization

FEAF and 8th Army Organization

The U.S.A.F. and Army developed a structured joint system for CAS that mandated a Joint Operations Center (J.O.C.), comprised of Army and USAF personnel that were responsible for the planning, coordination and execution of tactical support missions. Next to the JOC there was a Tactical Air Control Center (TACC), responsible for the allocation of air assets for interdiction, CAS and strategic bombing missions. Located forward with the troops was the Tactical Air Control Party (TACP) which was made up of a pilot and two enlisted radio operators utilizing a radio equipped jeep. Two limiting factors during the war were the experience of the TACP pilot and the reliability of communications equipment. (Whitson, 31)

It was found that the average experience level of a TACP was 21 days. This created a high turn over rate, which equated to a relatively low experience level in the field providing control for CAS. "TACP's are assigned to 8th Army for only a very short tour of duty without previous training as controllers, and as a result are usually inefficient for several days after arrival. (Whitson, 32)

When a target was spotted, the TACP controller would radio the army division it served which in turn would relay to the corps headquarters. The corps HQ would pass

the information to the JOC. The JOC would approve or disapprove the request. If approved then the JOC would task the TACC to allocate aircraft. The TACC would contact the supporting airfield to scramble the alert aircraft. The aircraft would then contact the requesting TACP for final instruction then strike. (Hallion, 42) The average response time during the month of August 1950 was 45 minutes to obtain a strike. Because of the time span it took USAF airpower to support ground forces in the opening stages of battle, the delays were sometimes fatal for 8th Army personnel.

Navy and Marine Organization

On August 7th the 1st Marine Brigade entered Korea in the defense of Pusan. Here the Marine TACP parties and OY observation aircraft orchestrated synergistic strikes that involved the “grunt” on the ground and Navy and Marine airpower at defending the perimeter at Chinju. This attack was credited in stifling a NKA attack that could have broken the parameter.

Marine TACP’s called strikes directly from the carriers *Badoeng Strait* and *Sicily*. These attacks operated so close to friendly forces that they became made an impression on Army ground forces. “The effectiveness of Marine CAS astonished Army troops fighting alongside.” (Hallion, 52) The apparent ease that the Marines and Navy could perform CAS strikes fueled the CAS fires that raged between the Army and Air Force services. This Navy and Marine CAS left a favorable impression on the infantrymen confronting a seemingly “invincible foe.” “They (the Army) cared little about the details of CAS; they only knew it saved their lives.” (Hallion, 53)

In the Philippines during WWII, the Marine TACP control parties operated on a limited front in a jungle hide out or from a cave that resembled the same situation in

Korea. In this environment, Marine land and air commanders held the belief that "front line control parties should talk planes onto a target by direct communication" and that relaying information through "intervening echelons" was inefficient. (Sherrod, 296) This experience and belief continued in developing the air support structure for Korea.

The Navy and Marine system of CAS at the beginning of the war was set up with the Marine TACP (Battalion, Regiment, or Division) utilizing the Tactical Air Request net (TAR) to contact the amphibious Tactical Air Direction Center (TADC). He was in direct contact with the Tactical Air Control Center "afloat". The TACC would then allocate the already airborne assets for attack. This organization was in effect until the USAF JOC took complete control of airpower after the Pusan campaign. (Whitson, 370) (Futrell, 705)

With the Marine CAS system, Navy and Marine airpower provided a response time of 5-10 minutes compared to the 45 minute response the 8th Army received from the FEAF. (Whitson, 21) In addition to the short response time, Navy and Marine air had an on station time averaging 73 minutes due to the type of aircraft they were employing. (Whitson, 21) This provided a tremendous flexibility for Marine TACP ground controllers and airborne Forward Air Controllers (FAC-A). (Hallion, 52) This situation was directly inline with Marine doctrine that airpower should be available for the ground commander to use at his discretion. (Sherrod, 297)

With this long time on station, controllers now had the flexibility to locate targets and then call in the airborne strikes during a fluid, constantly changing battle. The Marines provided an average of 37 close air support sorties per division per day as compared to the 19 that the Air Force provided for an army division. This equated to a

rate of 2.8 time's higher support the Marine ground forces received over the Army.

(Whitson, 12)

The Navy and Marine CAS organization reflected an experience by maritime forces to effectively support a lightly armed infantry on the ground. An experience that resembled what Korea demanded during the defense of the Pusan perimeter.

Part 5

Weapon Systems

USAF Weapons systems

The USAF doctrine after WWII called for a development of strategic bombing aircraft to carry out its mission in the future. Through this doctrine, the Air Force found itself possessing a large number of B-26 and B-29 aircraft to carry out the strategic bombing mission prior to Korea. During this time the jet age had also emerged and the USAF developed the F-80 and F-84 aircraft for the air to air battle in order to protect the strategic bombers. (Futrell, 706)

During the opening weeks in Korea, the FEAF had worked heroically to blunt the North Korean drive. The B-29's stationed out of Japan and Okinawa attacked targets in North Korea and performed interdiction missions in support of ground forces, attacking troop columns and transports. (Hallion, 46) However, utilizing the Korean mountainous terrain and traveling at night, the NKA was able to effectively avoid portions of the FEAF bombing raids and was able to move troops and equipment southward, pushing back the 8th Army towards Pusan. (Gunn, 8)

Because of the lack of fuel endurance of the F-80 and F-84 aircraft, the move to Japan created a time distance problem that impacted the support the 8th Army would have.

Partly due to the air support request structure the FEAF had set up and partly due to the Air Forces location in proximity to ground forces the average response time from air support request to bombs on target was 45 minutes.

The 45 minute response time by FEAF aircraft would allow for the following movement of the enemy (Whitson, 46):

Table 1 Enemy Movement

Equipment	Movement
Troops	1.9 miles
Tanks	11.2 miles on road and 3.7 off-road
Artillery	13.5 miles on-road and 4.5 miles off-road
Motorized Infantry	11.3 miles

* (Whitson, 46)

If USAF TACP's on the ground recognized a column of NKA soldiers moving towards them, this threat could be a factor for the 8th Army by the time USAF assets arrived on station. This was the case in the opening stages of Korea with the flood of North Korean Army soldiers moving southward.

The Air Force's system was much less capable of getting aircraft on target in short periods of time in a fluid situation. (Whitson, 21) Therefore, because of the response time, FEAF assets had no alternative then to concentrate its effort well outside of the bomblines, where the targets were more static.

Because of the distance from friendly forces and due to the type of aircraft USAF assets used (F-80 and F-84) the average time over a target was less than 30 minutes.

Army personnel were quoted as saying, "that jet aircraft were not suited for this type of mission (CAS) because of low endurance and high speed. (Whitson, 24) "Limited endurance means limited ordnance carrying capacity, therefore the jet carries less ordnance than any other aircraft employed in close support." (Whitson, 24) The effectiveness of aircraft for CAS was ranked by the study, which listed the aircraft as follows in order of effectiveness:

1. AD Skyraider (Navy)
2. F-4U Corsair (Navy)
3. F-51 Mustang (Air Force)
4. F-80 (Air Force)
5. F-84 (Air Force)
6. F-9F (Navy)
7. F-86 (Air Force)

*(Whitson, 25)

The impact on numbers of aircraft needed to support ground forces 100% of the time during daylight hours within 5 to 10 minutes then would have been as follows:

"A basic requirement for a system designed to attack targets near the bomblines (in a fluid environment) can be determined by noting that aircraft should be on target in 5 to 10 minutes after request, therefore, a flight of aircraft must be continuously on station to a division. Assuming an average daylight to be ten hours per day and considering only the requirement for day operations, ten flight hours per day are required. The rate of consumption of ammunition must match that for fuel. The ammunition requirement depends on the number of targets attacked. With this as a restriction, the above requirement for ten flight hours per day can be met. For example, with four flights having two and one-half hour's endurance over the target, or ten flights having one-hour endurance. Assuming four aircraft per flight, the requirement is then 16 and 40 for respective endurances for two and one-half and one hours. This is

approximately equivalent to 16 F-4U or F-51 type aircraft or 40 F-80 jet aircraft." (Whitson, 29)

It can be seen that the use of older propeller aircraft during the time of the Korean War provided a more efficient platform for CAS operations. However, the survivability of the jet due to its speed and surprise on NKA personnel was superior to the F-4U and AD airplanes. Aircrew realized the potential for jet aircraft to fulfill this role, and in Vietnam, strides were taken to increase the "punch" it could deliver.

The types of ordnance being delivered by USAF and Navy/Marine aircraft were the same. It was a combination of rockets for an anti-tank weapon, napalm and general-purpose bombs against troops and convoys. All weapons had the same effect on the target. However, the different delivery systems being used by the services impacted the effectiveness of CAS. Because of the nature of the Pusan perimeter it was the Navy and Marine delivery systems that proved more effective.

Navy and Marine Weapons systems

The strengths of the older propeller aircraft (F-4U and AD Skyraiders) as compared to the current jet aircraft at the time have already been mentioned. Below is a list of a typical Navy and Marine capabilities compared to the USAF tactical aircraft:

Table 2 Navy and Marine Capabilities

Aircraft	Rounds 20mm	# 500 pound bombs	# HVAR Rockets	Endurance
F-4U	800	2	8	4 hours
AD Skyraider	400	3	12	4 hours
F-80/F-84	N/A	2	None	1 hour 30min

* (Hallion, 47)

It can be seen that maritime airpower provided a more lethal blow.

However the lethal blow did not come without a penalty. The propeller driven aircraft were susceptible to enemy ground fire due to their low speed as opposed to the speedier more agile USAF jet aircraft. However the jet aircraft employed by the FEAF proved to be less accurate because they were more difficult to maneuver in the Korean valleys and therefore could not get as close to the ground and the target. The slower speeds and smaller turn radius associated with the F-4U and AD Skyraider allowed Navy and Marine aircraft to strike targets within a distance of 20 yards from Marine troops. (Hallion, 53) Also, propeller aircraft delivered ordnance in a steeper dive and at a lower altitude (500 to 1500 feet) than the jet aircraft (above 2000 feet) which increased the accuracy in delivering general-purpose bombs. (Whitson, 334)

The Russian built T-34 tanks also posed a significant problem to the Army and Marine Forces. U.S. ground forces were employed with little artillery and these heavily constructed tanks were impervious to anti-tank cannons and WWII bazookas, it fell largely to airpower to cope with this problem during the opening stages of battle. The primary weapon of choice was the rocket. (Hallion, 46) All USAF aircraft and Navy/Marine aircraft could employ this weapon. However, the older HVAR (High

Velocity Aerial Rocket) was less than effective in stopping the Soviet tank. At the Naval Ordnance Test Center in China Lake, the Navy developed an Anti-tank aerial Rocket (ATAR), nicknamed "ramjet". This rocket was an HVAR with a modified, more powerful, 6.5-inch diameter shaped charge warhead that was more capable in penetrating the enemy tanks. (Hallion, 49)

Again, the experience by Marines and Navy pilots in past conflicts in what was effective for support of ground forces was not abandoned at the beginning of the war but was a highly developed intricate system, able to effectively support the infantryman.

Part 6

Communications

USAF Communications

During the Pusan campaign, it was found that the TACP controllers were capable of conducting accurate control within a couple miles of friendly troops.

There were several limitations in the TACP concept employed. The first one was response time of FEAF aircraft in a changing environment as mentioned before. The second and third weakness is a product of the Air Forces doctrine prior to Korea. Doctrine impacted the training and experience of TACP crews and also the lack of procuring sufficient quantities of effective communications equipment.

TACP crews consisted of one TACP airman and two enlisted radio operators. It was found that the high turn over rate and the lack of emphasis put on training TACP controllers prior to the war contributed to the ineffectiveness of providing accurate CAS control. (Whitson, 23)

The radios and equipment utilized by USAF TACP parties were old and out dated. It was found that the AN/ARC-1 radio jeep was not suited for the rugged mountainous terrain of Korea. "Air - ground communications equipment, and maintenance for that on hand, resulted in operations of low efficiency." (Whitson, 23) "Communications is the number one problem." (Whitson, 23) A division commander during Pusan said, "When

they (communications) are bad, as they are so much of the time, close support isn't worth a damn." (Whitson, 23)

Also when the FEAF showed up to the fight they were flying L-17 FAC (A) air control aircraft. These old outdated aircraft had visibility problems and a number of them were lost to enemy YAK aircraft. The FEAF then went to the Piper Cub, which helped visibility but still had the same vulnerability to ground and airborne fire due to its slow speed and light airframe. Eventually, they incorporated the T-6 Mosquito, which had an improved 8 channel AN/ARC-3 radio, was faster, more durable and became quite successful not only in CAS support missions but also reconnaissance. (Hallion, 44)

The T-6 aircraft exploited attacks on targets averaging five miles behind enemy lines. (Whitson, 31). This aircraft was very effective in identifying and locating static targets beyond the bomblines for air interdiction sorties. The FEAF flew a large number of these sorties during the later stages of the war and is credited for destroying massive amounts of NKA convoys and troop columns.

Navy and Marine Communications

The Nicaraguan conflict in 1927 also produced another first for Marine air in support of ground forces. The Marines were the first to direct an air attack from the ground when a 25 manned Marine patrol laid out ground panels indicating to Marine pilots the direction and range to a 175 manned enemy troop concentration.

In the Pacific during WWII, the Navy and Marines evolved a joint system of CAS starting with the bloody invasion of Tarawa. Liaison parties with ground forces assisted commanders in selecting suitable targets and then directed the incoming strike force with

ground or airborne controllers. By Okinawa, improved air-to-ground communications enabled ground commanders themselves to call in air strikes. (Hallion, 43)

Out of those experiences, the Navy and Marines developed an improved 12 to 20 channel VHF radio that included the continuous monitor of the "guard frequency". These radios were incompatible with the 8 channel sets that T-6 aircraft were utilizing for control. (Hallion, 45) This problem was even more frustrating for Marine and Navy forces because those Air Force 8 channel sets would always be over saturated to the point where CAS was ineffective due to communications. (Whitson, 23)

The TACP party located with the Marine battalion, regiment and Corp levels was a highly trained officer that went to TACP School for 12 months. In this school the Marine aviator adopted a principle that "close support aviation is only an additional weapon to be employed at the discretion of the ground commander". (Sherrod, 294) He also learned that "close support should be immediately available and should be carried out deliberately, accurately and in coordination with other assigned units." (Sherrod, 295)

The TACP had a party made up of approximately ten enlisted personnel that ranged in experience and technical levels. This provided the Marines with a higher reliability rate as far as maintenance was concerned with newer specialized equipment and a more effective experience controller since he would spend 6 to 8 months at the same position vice the 21 days of Air Force airman.

The Marines also developed a highly efficient OY observation aircraft before the war that suited their needs.

The specialization and effectiveness of the communications equipment reflect commitment Marines made towards supporting ground forces.

Part 5

Conclusions

After WWII the USAF was equipped and trained to fly in large formations attacking strategic targets that would capitulate a country to do whatever the United States' strategic objectives were. However, the Korean agrarian culture and landscape provided a pitiful target selection to warrant the large-scale bomber formations they were accustomed to. Ridgeway was quoted as saying; "there is simply no such thing as choking off supply lines in a country as wild as North Korea. (Hastings, 267) There was also no way to effect an army that operated on only 50 tons of supply a day and was moved by man or ox. (Hastings, 267)

In a generation that encompassed industrial societies and possessed targets that a well-planned and coordinated strategic attack could defeat, the enemy's center of gravity turned out to be it's army and it's people. A target the USAF had not fully prepared for and one that the U.S. Army was initially ill equipped to fight.

During the course of the first six months in Korea, the 5th Air Force dropped 59,700 tons of bombs, 26,300 canisters of napalm, 157,000 rockets and 53,600,000 rounds of .50 cal ammunition. This overwhelming effort through interdiction sorties played a critical role in stopping the waves of North Korean soldiers as they marched southward across

the Korean peninsula. Also, the effectiveness of both CAS systems would have been in jeopardy if it were not for the air superiority provided by the FEAF. (Hastings, 262)

However the emphasis of this paper is on the close air support provided by Marine and Naval air which effectively supported ground forces due to doctrine. It can easily be stated that the effectiveness and efficiency that Navy and Marine air provided Marine ground forces was vastly superior to that received by the 5th Air Force.

Prior to June 1950, the Marines and Navy had a well entrenched efficient system of close air support that gave Marine infantrymen the critical artillery support they required and was the envy of the 8th Army. So much so, that in the spring of 1951, Marine Air assets were divided up each supporting a division of the 8th Army. This was done so Army ground forces could receive "on call" CAS by assets with a generous amount of firepower. During the course of the Korean War neither the Army nor the Air Force found an acceptable solution to the problem of providing tactical air control for front line air strikes. (Futrell, 707)

Looking at the Korean experience it can be seen that air power must be ready for all contingencies. Due to the political changing environment, thinking of airpower in its last success can create inefficiencies in procurement, training and doctrine which can lead to in efficient results in follow on campaigns.

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